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Response to the RSPG public consultation on strategic spectrum roadmap towards 5G for Europe – 2nd Draft RSPG Opinion on 5G networks

Content

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1. Motivation and contributors

ZVEI - German Electrical and Electronic Manufacturers' Association represents the manufacturers of the components which are necessary for the 5G-infrastructure as well as potential user industries, such as industrial automation, energy, healthcare, connected mobility, smart home, TV-Manufacturers and PMSE (programme making and special events) applications.

The **manufacturing industry** is currently subject to a fundamental change, which is often referred to as the "Fourth Industrial Revolution" or simply "Industry 4.0". The main goals of Industry 4.0 are — among others — the improvement of flexibility, versatility, resource efficiency, cost efficiency, worker support, and quality of industrial production and logistics.

Nowadays, wireless communication is primarily used for special applications and scenarios (e.g. for connecting standard IT hardware to a production network and similar rather non-critical applications). On the one hand, this is because there was no need for wireless connectivity in the past, due to relatively static and long-lasting production facilities. On the other hand, this is because most existing wireless technologies fall short of the demanding requirements of industrial applications, especially with respect to end-to-end latency, communication service availability, jitter, and determinism.

With the advent of Industry 4.0 and 5G, however, this will change fundamentally since only wireless connectivity can provide the degree of flexibility, mobility, versatility, and ergonomics that is required for the "Factories of the Future"[1]. Thus, 5G will significantly contribute to revolutionizing the way how goods are produced, shipped, and serviced throughout their whole lifecycle.

The need for a high-performance digital infrastructure is therefore of vital importance. In addition to technological challenges, an appropriate regulatory framework should be in place to allow innovation and opportunities for the manufacturing industry.

With a view to **programme making and special events (PMSE)**, the number of devices in use is continuously growing and many events, especially within the cultural and creative sector, would no longer be possible without PMSE. In the last years, the spectrum available for the PMSE industry has been considerably reduced. Furthermore for physical reasons, not all currently available frequency ranges are suitable for PMSE. 5G may become a suitable alternative to share spectrum with other applications.

We welcome the dialogue process offered by the Radio Spectrum Policy Group (RSPG) of the European Commission with the *Public consultation on Strategic spectrum roadmap towards 5G for Europe – 2nd Draft RSPG Opinion on 5G networks*.

The present document contains the response to the RSPG public consultation mainly developed by the ZVEI Automation Association (Task Force 5G).

[1] 3GPP TR 22.804 V1.0.0
https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3187

This response is supported by the following member companies of ZVEI:

- Beckhoff Automation GmbH & Co. KG
- Hirschmann Automation and Control GmbH
- PHOENIX CONTACT ELECTRONICS GmbH
- Robert Bosch GmbH
- Sennheiser electronic GmbH & Co. KG
- Siemens AG
- Yokogawa Europe B.V.

The following companies and organizations, which are not members of ZVEI, also support and endorse the present response:

- Audi AG
- Mercedes-Benz
- VDMA Electrical Automation
- Volkswagen AG

The above companies and organizations remain at your disposal for any question you may have.

2. Response to the RSPG public consultation

2.1 Key elements

The companies and organizations supporting the present response consider that the following aspects are of key importance to achieve a successful deployment of 5G in Europe.

We invite the RSPG to take these key elements into account during the ongoing development of a strategic spectrum roadmap towards 5G in Europe.

i. Spectrum needs

In general all manufacturers need regulatory certainty when considering investments for technology deployment. Therefore spectrum allocation should be planned with foresight and also has to take into account the requirements of current spectrum users.

a. Spectrum needs for Industry 4.0

Applications in the field of sensors/actuators are usually characterized by small amounts of data (per device) with a short duty cycle and a high number of nodes. New applications arise in the field of complex sensors with higher data rates (e.g. IR cameras, human-machine collaboration, augmented reality). Systems supporting these applications are operated usually simultaneously and in close proximity to each other and a degradation of service quality by interaction is not allowed. This requires a spectrum of at least 200 MHz.

b. Spectrum needs for PMSE and terrestrial TV

With the allocation of the 700 MHz and 800 MHz bands to mobile services, PMSE applications has lost almost half of its spectrum. Not all potential bands suggested so far would be technically suitable and therefore do not compensate for this loss. Suitable alternative spectrum for the loss of the 700 MHz and 800 MHz bands must be identified in 2020 and not later in 2025.

DVB-T2 HD services and PMSE normally operate below the 700 MHz Band (470 - 694 MHz) and already had to be shifted because of the so-called “Digital Dividend”. Therefore in order to ensure the long-term viability of PMSE and terrestrial TV, regulatory certainty and stability should be ensured in the remaining UHF spectrum below 700 MHz (470 - 694 MHz) at least until 2030 as also stated within the Lamy report[2].

ii. Industry 4.0 applications should be able to be built and run as private networks

Private operation of a 5G network is necessary for the following reasons:

a. Operational safety & data protection: for reasons of liability, full control over the data and access to sensors/actuators as well as full control over

[2] https://ec.europa.eu/digital-single-market/en/news/report-results-work-high-level-group-future-use-uhf-band

the implemented security and data protection measures is mandatory. In addition, technicians of public network operators who have to maintain network infrastructure components pose a potential security threat in certain areas of the company (e.g. with regard to industrial espionage).

b. Decoupling from the wide area network (WAN): In a factory environment, decoupling of production lines is an important design paradigm. This guarantees a continuation of production even after disconnection from the outside world. This reduces the dependency on a 5G WAN (or a core network of a public network operator) and ensures the required high quality of service under all conditions.
c. Economic aspects: The implementation of applications via a public network will lead to higher overall costs due to the lack of appropriate coverage in industrial indoor operation. Apart from that, these applications would be dependent on the infrastructure of a particular local network operator. This can therefore become a decisive factor for competition between different production companies. SMEs in rural areas in particular, with a delayed 5G network deployment, would be particularly affected.

iii. Need of local and regional spectrum allocations

Local and regional spectrum allocations would be needed for the implementation of sophisticated industrial communication applications and to contribute to an efficient spectrum use. The implementation of this principle is already being considered by some EU Member States (e.g. Germany foresees local and regional allocations in 3.7-3.8 GHz[3]).

In this regard, some aspects should be considered:

a. The granularity should be such that a license can also be granted for a small production plant of an SME. Otherwise, there is a risk that the availability of spectrum will be a decisive factor for the competitiveness of a company.
b. In highly densely populated industrial areas, appropriate measures shall be taken to ensure non-discriminatory and transparent access to the spectrum for all parties concerned.
c. Regional spectrum allocations should not exceed the actual individual geographic needs (e.g. grant a license to Company A covering a geographic area of Company B).

2.2 Text proposals

The proposals for modification of the 2nd Draft RSPG Opinion on 5G networks are underlined below. These are based on the key elements presented in section 2.1 of the present document.

[3] https://www.bundesnetzagentur.de/EN/Areas/Telecommunications/Companies/FrequencyManagement/ElectronicCommunicationsServices/ElectronicCommunicationServices_node.html

1. **RSPG Opinion**

[…]

4. The RSPG is of the opinion that service performance and availability requirements may be relevant for some 5G cross border services to fully function and would need to be defined by the industry in a timely manner. In some cases an EU coordinated approach could be helpful in this regard to support a common European solution, e.g. harmonized 5G-frequency block for vertical applications.

[…]

11. The RSPG is of the opinion that 5G is an enabler technology to foster European vertical industries (e.g. Smart Manufacturing, Smart Grids, autonomous driving, etc.). Technical requirements and regulatory framework may be different for each vertical industry. There should be options available for the deployment of private 5G-networks for the vertical industries.

2. **A2.3 Considerations of the Relevance of 5G to IoT, ITS and verticals**

[…]

The demand for business-specific applications could largely be covered by mobile providers. Making spectrum available for niche players could give them the opportunity to offer specific applications, both using their own infrastructure (e.g. within an industrial plant or production site) and as service providers using the infrastructure of a mobile operator.

Some new applications, such as the Internet of Things, Smart Manufacturing or providing indoor coverage, may also develop in spectrum under a general authorisation regime. General authorised frequency use for these applications can be an important breeding ground for innovation and contributes towards a dynamic market environment. European Smart Manufacturing countries are closely connected and there should be taken into account an Europe-wide harmonized 5G-spectrum block for general authorized spectrum.

3. **A2.4 Coverage**

A2.4.1 Coverage and roll-out obligations

[…]

A coverage obligation is an obligation to provide a certain service in a given area (e.g. vertical industry in rural areas) or to a certain percentage of the population, usually within a specified time period. This obligation will be part of a national policy to make certain services available to consumer and/or business users.

[…]

A rollout obligation is designed with the intention of securing the timely deployment of services that the market could be expected to provide in due course, to a particular timetable and in a specific frequency range. It is therefore calibrated to bring forward investment (and the ancillary benefits of that investment) to a fixed point (potentially with a number of interim staging points) rather than to secure new investment into areas where it would not normally be expected to be economic for the provider over the longer term. Local private 5G-networks could solve this issue by rollout of demand driven networks (e.g. within industrial plants, production sites) independent of national roll out plans of mobile operators.